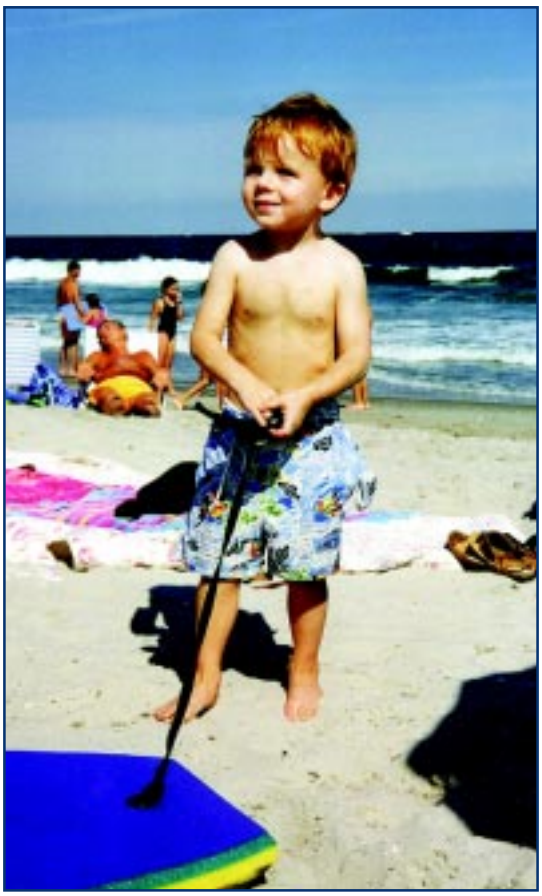
Steve Delaney, U.S. Environmental Protection Agency

Aquatic Resources: An American Treasure

Our economy depends on clean water; we all pay when water is polluted. Contamination of drinking water sources means higher health risks and increased treatment costs. Closed beaches and contaminated rivers mean lost revenue for local businesses that serve tourists, anglers, and recreationists. Swimmers at polluted beaches and lakes face possible threats from viruses and bacteria. Protecting our nation's liquid assets is vital for our economic future as well as for our own health and well-being.

In a recent report, *Liquid Assets 2000: America's Water Resources at a Turning Point*, EPA documented the critical importance of our water resources to our nation's economy. In many ways, clean water is the fuel that powers the nation's economic engine.

- A third of all Americans visit coastal areas each year, making a total of 910 million trips while spending about $44 billion.
- Water used for irrigating crops and raising livestock helps American farmers produce and sell $197 billion worth of food and fiber.
- The $111 billion generated annually by the U.S. fishing industry is heavily dependent on healthy watersheds. About 70 percent of commercially harvested fish depend on wetlands and nearby coastal waters at some stage in their life cycle.
- A *Money* magazine survey found that clean water and clean air are two of the most important factors Americans consider in choosing a place to live.
- Manufacturers use about 9 trillion gallons of fresh water every year. The soft drink manufacturing industry alone uses more than 12 billion gallons of water annually to produce products valued at almost $58 billion.



Patty Scott, U.S. Environmental Protection Agency

John McShane,
U.S. Environmental Protection Agency

Progress and Challenges

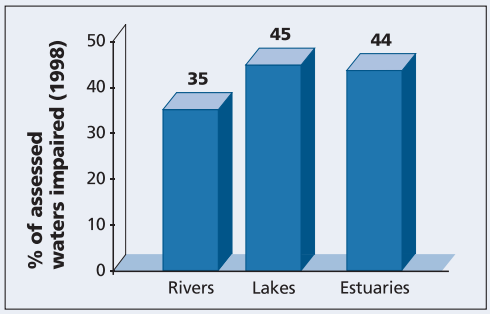
The United States has made tremendous progress in cleaning up America's waters over the past 30 years. The nation's significant investment in upgrading sewage treatment and minimizing discharges from industrial facilities has removed billions of pounds of pollutants from our waterways and more than doubled the number of waters safe for fishing and swimming.

Despite this resounding success, many challenges remain. An overwhelming majority of Americans—218 million—live within 10 miles of a lake, river, stream, or coastal area that does not support its designated uses set by the states under the Clean Water Act. States have identified almost 300,000 miles of rivers and streams and more than 5 million acres of lakes that do not meet water quality goals. Many of these waterways are not considered safe for fishing and swimming and do not support healthy fish or other aquatic life.

Runoff polluted by agricultural lands, residential areas, city streets, forestry practices, and even pollutants deposited from the air now poses the greatest threat to our nation's waters. At the beginning of this new millennium, problems such as habitat destruction, landscape modification, invasive species, and the depletion or contamination of ground water present new challenges not easily solved by traditional engineering-based pollution control.

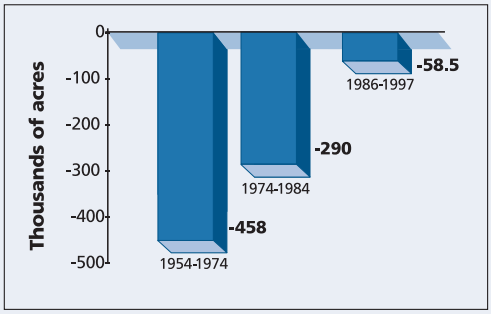
Over the past decade, the Environmental Protection Agency's Office of Wetlands, Oceans and Watersheds (OWOW) has helped to lay the groundwork for a new era of environmental protection. Many of the accomplishments of the past 10 years have been achieved through collaborative watershed partnerships. Although EPA is encouraged by these successes, it is apparent that much work remains to be done. Meeting the challenges of the new millennium will require innovation, adaptation, technological advances, and additional partnerships. The watershed paradigm will provide the framework for addressing these complex environmental problems through coordinated, collaborative efforts at the local level.

Our rivers, lakes, and coastal waters are cleaner today than 25 years ago, but...



....many assessed waters are still not considered safe for swimming and fishing.

Losses of wetlands have been significantly reduced, but....



...less than half of the wetlands in the contiguous states remain and annual losses continue to exceed gains.

Bruce Batten, U.S. Fish and Wildlife Service

Meeting the Challenges
The Rise of Watershed Management

In 1890 John Wesley Powell, second director of the United States Geological Survey, suggested that the western United States be organized into watershed units to facilitate an integrated approach to natural resource management. Powell's recommendations were not followed, and for the better part of the 20th century the country managed its water resources in a piecemeal fashion. The industrial age transformed the country: along with mass production of consumer goods and a workforce that moved from farm to factory, air and water pollution fouled the skies, streams, and shores. The publication of Rachel Carson's *Silent Spring*, the blowout at Platform A in the Santa Barbara channel, and the conflagration on the Cuyahoga River provoked a public outcry, the organization of the first Earth Day, and in December 1970 the establishment of the Environmental Protection Agency. The Administration and Congress crafted a new Clean Water Act (CWA) in 1972, which provided uniform national technology-based pollution control requirements for most industrial and municipal "point sources" of water pollution. The act also provided for water quality-based controls where the minimum technology approach was inadequate.

In 1987 the CWA was amended to provide for programs to abate polluted runoff in discharges not conveyed by point sources (e.g., pipes, channels, outfalls, etc.). Substantial grant support for these programs followed.

These efforts, pursued by governments at all levels, industry, and private citizens, brought about considerable progress but also revealed the limits of effectiveness of separately implementing the programs. They also highlighted the prevalence of problems *not* readily amenable to solution through traditional tools—sprawl, terrestrial habitat destruction, air deposition, and others.

In 1990 EPA was in search of a new paradigm that could guide efforts in the last decade of the 20th century and beyond. Looking at a number of EPA's own geographically targeted efforts, the Agency recognized that the time had come for a basin-wide approach like the one Powell had envisioned. Efforts to clean up the Chesapeake Bay in the 1980s had illustrated the value of such an approach. A coalition of concerned citizens, academicians, and government officials recognized that the bay's aquatic resources would still be at risk even if all the sewage treatment plants were brought into compliance with the law. Only through coordinated efforts at all levels of government, and among both the public and private sectors, and through the use of both mandatory and voluntary programs would the bay's important resources be restored. Several other geographically based programs, such as the National Estuary Program, the Great Lakes Program, and the Wellhead Protection Program, were also beginning to demonstrate the advantages of bringing together the people who use and benefit from the water resource to plan for and implement environmental improvements.

Thus began the Office of Water's movement from a pollutant-by-pollutant, industry-by-industry, facility-by-facility fragmented approach to a more holistic

watershed approach. EPA began to actively encourage states, tribes, local, and other federal partners to join in taking this "place-up" perspective. By focusing on the problems holistically within a watershed, managers at all levels could better understand the cumulative impact of various activities, determine the most critical problems, better allocate limited financial and human resources to address those needs, engage stakeholders, win public support, and make real improvements in the environment. Over the past 10 years, the Office of Water has encouraged this approach not only for its own programs (nonpoint sources, wetlands, permits, standards, drinking water, and coastal programs) but also as a way to integrate efforts of sister agencies, states, tribes, local governments, industry, and nonprofits.

Regional Pilots

In the early 1990s EPA initiated a large number of watershed projects in each of the 10 regions to broaden the practice of watershed management. EPA staff played a variety of roles, ranging from leader and catalyst to facilitator and participant. The successes of many of these initial projects—Savannah River, Clear Creek, Canaan Valley, Merrimack River, and Big Darby, to name a few—confirmed that the Agency was headed in the right direction.

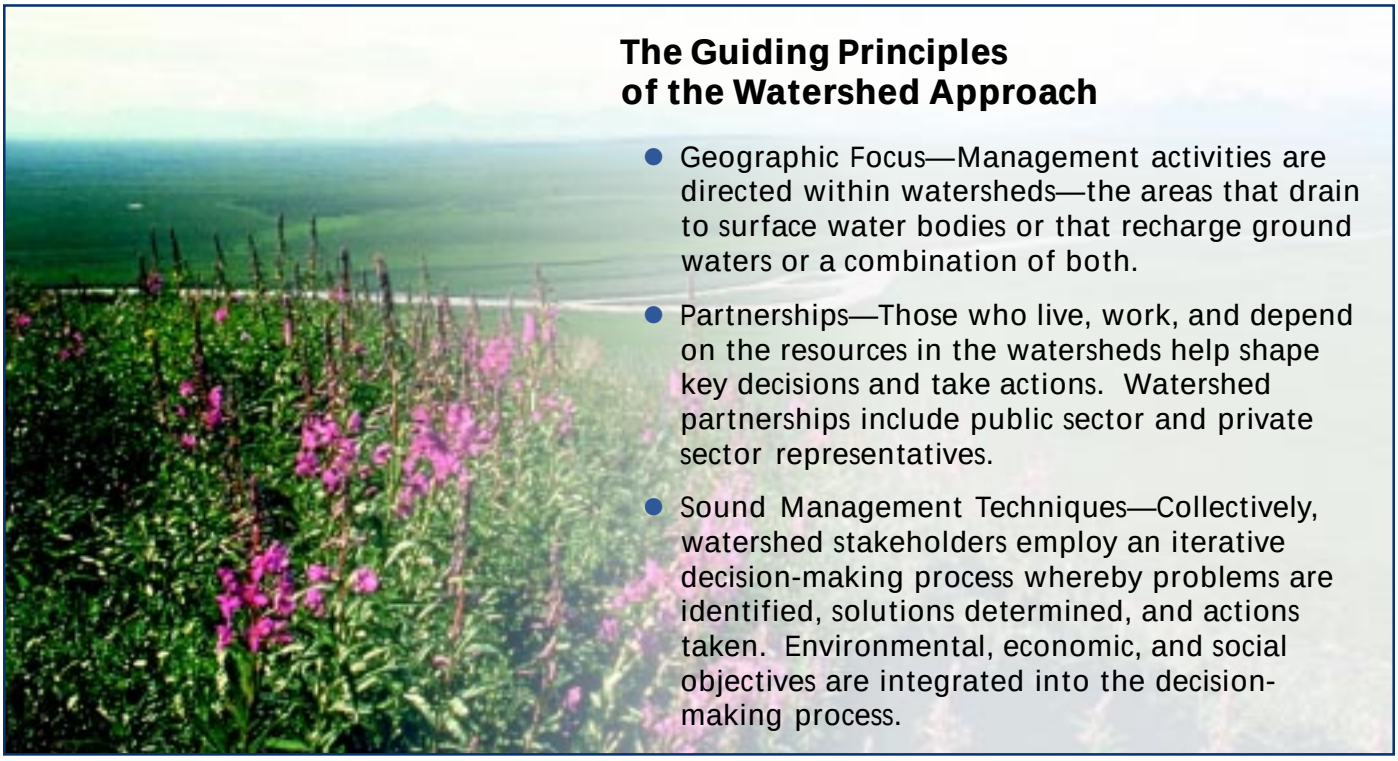
To spread the word about the watershed approach, OWOW has employed a variety of outreach efforts, including newsletters, national conferences, publications, and campaigns. Through a series of annual reports, OWOW helped document early watershed success stories.

Watershed Events

Since 1991 OWOW has worked with other federal agencies to publish *Watershed Events*. Through this popular newsletter, with a circulation of more than 6,000, OWOW continues to provide a vehicle to share ideas, tools, and success stories among federal, state, local, and private watershed practitioners across the country. Copies are available at www.epa.gov/OWOW/info/WaterEventsNews.

Watershed '93 and Watershed '96

In 1993 and 1996 OWOW spearheaded two major national conferences on watershed management. *Watershed '93: A National*



J & K Hollingsworth, U.S. Fish and Wildlife Service

The Guiding Principles of the Watershed Approach

- Geographic Focus—Management activities are directed within watersheds—the areas that drain to surface water bodies or that recharge ground waters or a combination of both.
- Partnerships—Those who live, work, and depend on the resources in the watersheds help shape key decisions and take actions. Watershed partnerships include public sector and private sector representatives.
- Sound Management Techniques—Collectively, watershed stakeholders employ an iterative decision-making process whereby problems are identified, solutions determined, and actions taken. Environmental, economic, and social objectives are integrated into the decision-making process.

Conference on Watershed Management, cosponsored by 11 federal agencies and supported by numerous stakeholders, attracted more than 1,000 people from all walks of life to hone their understanding of watershed approaches, build new relationships, learn from others' experiences, and explore options for the future. A follow-up conference, *Watershed '96*, attracted nearly twice as many participants, and countless others joined the conference through satellite downlinks from across the country.

Adopt Your Watershed

In 1997 to encourage stewardship of the nation's water resources, OWOW launched an "Adopt Your Watershed" campaign. OWOW created a national, on-line catalog (www.epa.gov/adopt) of organizations involved in protecting local water bodies, including formal watershed alliances, local groups, and schools that conduct activities such as volunteer monitoring, cleanups, and restoration. More than 3,000 groups are listed watershed-by-watershed, making it easy for anyone to find out how to get involved.

Realigning policies and procedures to integrate the watershed approach has been challenging. Through a high-level Watershed Management Policy Committee and various interagency workgroups, OWOW facilitated many EPA and cross-agency reinvention efforts. Some programmatic changes, such as removing barriers to issuing permits on a watershed basis, have dramatically reshaped the way EPA, other federal agencies, and the states do business.

Watershed Framework Document

In 1996 guided by several years of watershed experiences, OWOW published *Watershed Approach Framework* (www.epa.gov/OWOW/watershed/framework.html), which helped further define the watershed approach and established its key guiding principles. The document, developed with input from state and tribal officials, outlined specific steps EPA's Office of Water could take to better support the watershed approach. It also described how states and tribes could adopt comprehensive statewide watershed frameworks.

The Six-Part Strategy

In 1992 EPA adopted a six-pronged strategy to support the watershed approach.

- Try it—Initiate and carry out activities on a watershed basis.
- Advertise it—Promote the approach using a variety of opportunities, including conferences, newsletters, and publications.
- Integrate it—Align programs on a watershed basis.
- Finance it—Provide funding for pilot projects and capacity building.
- Develop tools for it—Provide training and technical assistance.
- Measure it—Monitor success and make changes as necessary.

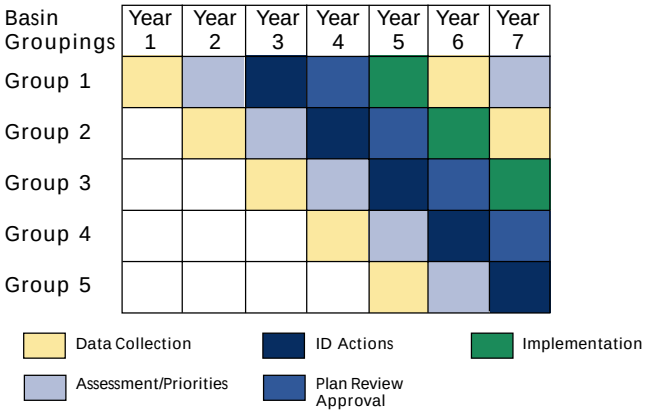
Over the past 10 years, this six-part strategy has borne considerable fruit, and it continues to guide EPA's efforts to reinvent its programs in support of the watershed approach.

Watershed Assistance Grants

In 1998 EPA teamed up with River Network, a national nonprofit organization specializing in organizational skill-building, to establish the Watershed Assistance Grants Program. The purpose of this program is to support local watershed partnerships during their development and to contribute toward watershed protection and restoration actions. To date, 69 projects have been funded, totaling more than $1 million. The funded projects include the following:

- The Mississippi River Basin Alliance (Mississippi) is helping communities implement nutrient management and watershed planning systems to address the "dead zone" at the mouth of the Mississippi through a facilitated consensus-building process of public meetings, workshops, and conferences.
- The Rogue Basin Coordinating Council (Oregon) is preparing a collaborative assessment of all human-made barriers to anadromous fish passage within the basin and developing an action plan for barrier removal.
- The Navajo Nation (Arizona) is implementing a community program to address the concerns of resource degradation and implement best management practices.

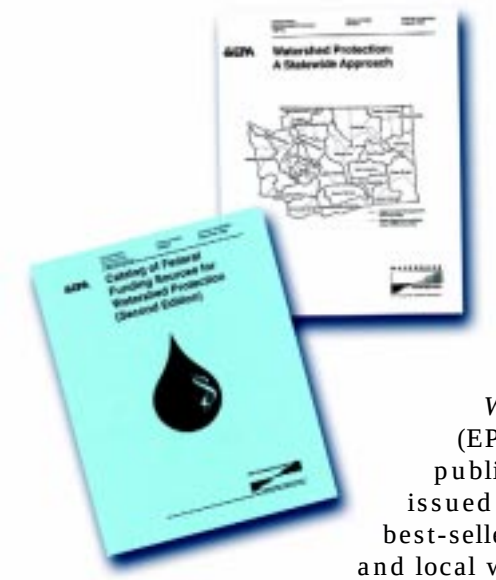
State Rotating Basin Approach



Process Guides

In 1995 OWOW published *Watershed Protection: A Statewide Approach* (EPA-841-R-95-004). It describes the benefits of rotating basin management programs and provides examples of successful programs set up by state agencies. Another publication, *Watershed Protection: A Project Focus*, provides a blueprint for designing and implementing successful watershed projects.

To help finance the approach, OWOW has used its limited resources to support model efforts and to build local and state capabilities. Clean Water Act section 319 grants and state wetlands development grants, for example, now support more comprehensive approaches to dealing with nonpoint source pollution and wetland protection. Recognizing the need for additional funding at the local level, EPA launched the Watershed Assistance Grants Program in 1998.



The Catalog of Federal Funding Sources for Watershed Protection (EPA-841-B-99-003), first published in 1997 and reissued in 1999, remains a best-seller among federal, state, and local watershed practitioners alike. The second edition of the document highlights federal grants and loans that may be used at the local level to support watershed projects, and it contains references to many other good publications and web sites on funding and technical assistance.

Good tools, sound science, and experienced personnel are instrumental to successful watershed management. OWOW has responded to these needs with state-of-the-art training and technical assistance.

The Watershed Academy

In 1994 OWOW initiated the Watershed Academy to provide training for federal, state, local, and private watershed practitioners. Over the years, more than 20 states have received direct assistance for developing comprehensive state watershed approach strategies. The Academy's *Inventory of Watershed Training Courses* (EPA-841-D-98-001), which currently includes summaries of 180 courses, provides easy access to information about training opportunities offered by other federal and state agencies, as well as the private sector. In addition to field and classroom experiences, the new Web-based (www.epa.gov/watertrain) training site now includes 40 self-paced modules and self-tests and offers an entirely Internet-based Distance Learning Certificate Program.

EPA/OPM Watershed Partnerships Seminar

Working in partnership with the U.S. Office of Personnel Management's (OPM) Management Development Centers, EPA designed and implemented several Watershed Partnership seminars. These 2-week residential seminars emphasize community-based partnership building and decision-making in unique geographic areas. Basic skills, potential pitfalls, and rewarding results of community-based environmental partnering and decision-making are explored. Tools and strategies for building partnerships and working effectively at the community level are provided. This seminar is the only course developed collaboratively by an agency and OPM to be incorporated into OPM's Management Development curriculum. About 150 EPA staff, 40 representa-

tives of other federal agencies, 30 state employees, and 50 private sector, local government, and nonprofit organizations have completed the seminar.

Lessons Learned

Top Ten Watershed Lessons Learned (EPA-840-F-97-001), a publication developed by OWOW in 1997, took stock of the Office's experiences and offered solid advice to

watershed managers on important lessons learned over the past decade. This document continues to offer valuable advice to both new and old watershed practitioners on what works and what does not.

Stream Corridor and Ecosystem Restoration

Fifteen federal agencies, with leadership from EPA and the U.S. Department of Agriculture, developed a guide to restoring stream corridors so that they can be used for drinking water supply, fish and wildlife habitat, recreation, and agriculture, as well as flood prevention and erosion control. *Stream Corridor Restoration: Principles, Processes, and Practices* (EPA-841-R-98-900) reflects the collective experience, skills, and technology of these federal agencies and their private sector partners. Recognition of the value of stream corridors has come with the understanding of what has been lost through uninformed or misguided actions on many streams and the watersheds that nourish them.

Internet Technologies

Taking full advantage of new Internet technologies, OWOW launched the *Surf Your Watershed* (www.epa.gov/surf) web site in April 1997. Simply by pointing and clicking, citizens can find their watershed, learn about its condition, and link to other key environmental data.

Building on *Surf*, OWOW joined forces with other federal agencies in 1999 to develop the new Internet-based *Watershed Information Network* (www.cleanwater.gov/win) to provide consolidated information about watershed programs and resources. WIN answers basic questions like the following: "What is the environmental condition of my watershed?" "What tools are available?" "How can I get involved?" Information is broken down watershed-by-watershed, covering more than 2,000 watersheds in the country. WIN also links users to financial, technical, and hands-on assistance available from EPA and other federal and nonfederal partners.

WIN includes the *Index of Watershed Indicators (IWI)*, which describes the health of the aquatic resources of each watershed. IWI uses a scoring system based on a number of layers of data such as state water quality assessments, fish consumption advisories, and incidence of contaminated sediments. IWI also provides information on the relative vulnerability of each of the nation's watersheds to future contamination.

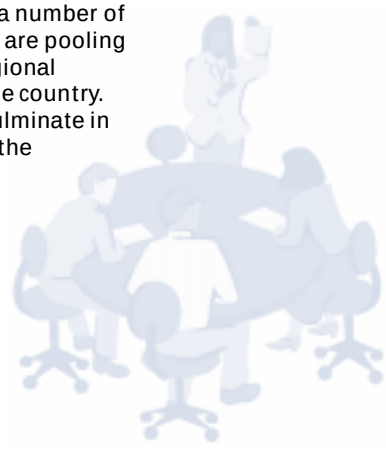
Surf Your Watershed
A Service to Help You Locate, Use, and Share Environmental Information about Your Place.

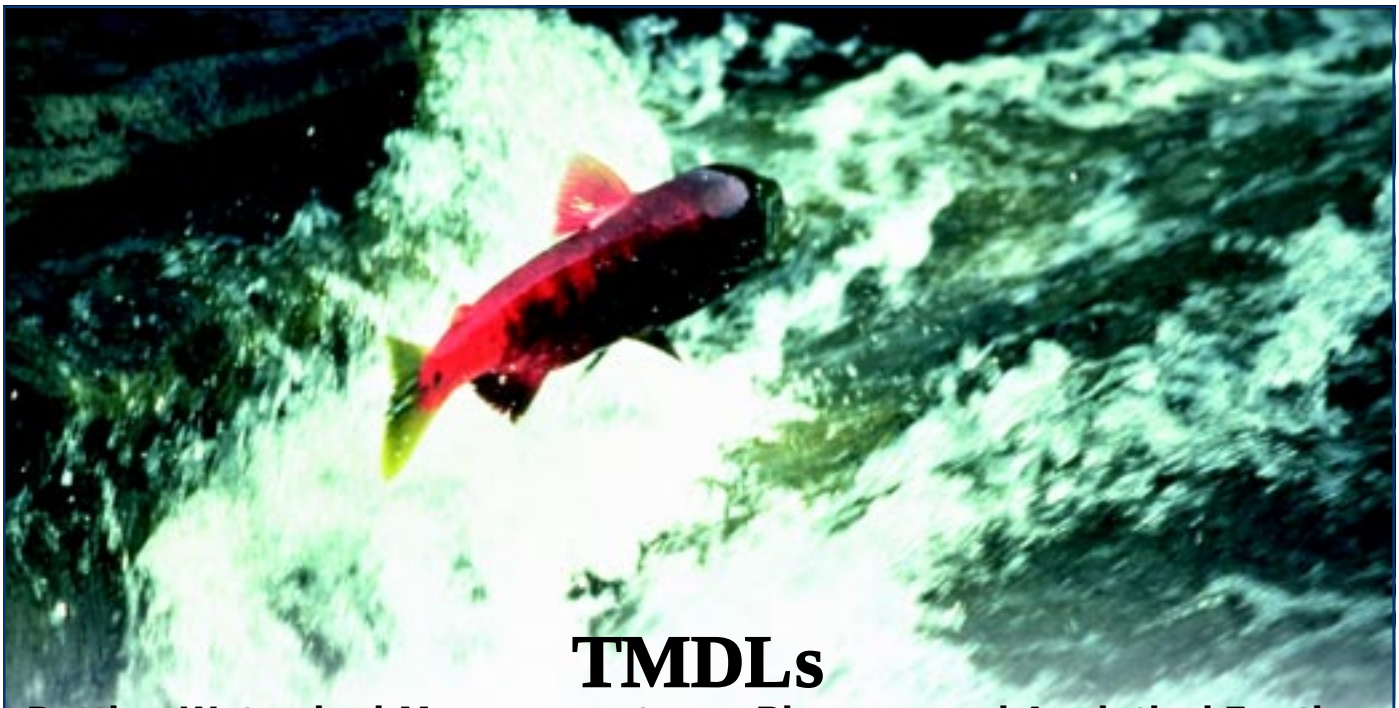
Watershed Information Network WIN

Taking the Pulse of America's Watersheds

Watershed Roundtables and the National Watershed Forum

To measure our success to date, a number of federal agencies, including EPA, are pooling their resources to support 13 regional watershed roundtables across the country. These roundtables, which will culminate in a National Watershed Forum in the summer of 2001, are bringing diverse stakeholders together for dialogue and information exchange on community-based watershed protection and restoration efforts. In 2001 OWOW will release a watershed restoration report summarizing the findings of the roundtables and suggesting new directions.





U.S. Fish and Wildlife Service

TMDLs

Putting Watershed Management on a Rigorous and Analytical Footing

The TMDL Program

Under section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters—303(d) lists. These impaired waters do not meet the water quality standards that states have set for them, even after point sources of pollution have installed the required levels of pollution control technology. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters.

What Is a TMDL?

A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and it allocates pollutant loadings among point and nonpoint pollutant sources. By law, EPA must approve or disapprove state lists and TMDLs. If a state submission is inadequate, EPA must establish the list or the TMDL. TMDLs are a form of "pollution budget" and can be the analytical underpinning for watershed management and protection decisions by the local community and the state.

In recent years OWOW has taken several steps to support the use of the watershed approach through the TMDL program. Although TMDLs have been required by the Clean Water Act since 1972, states and EPA did not emphasize implementation of section 303 (d) until the mid-1990s. Several years ago citizen organizations began to bring legal actions against EPA seeking the listing of waters and development of TMDLs. To date, there have been about 40 legal actions in 38 states. EPA is under court order or consent decrees in many states to ensure that TMDLs are established by either the state or EPA.

Some 2,000 TMDLs have already been developed, but states, tribes, and EPA have listed about 20,000 waterbodies as needing TMDLs because of more then 36,000 impairments (combination of pollutants and waterbodies). These waterbodies represent approximately 40 percent of the nation's assessed waters, including more than 300,000 river and shore miles and 5 million lake acres.

Regulations to implement the TMDL provisions of the Clean Water Act were established in 1985 and amended in 1992. In July 2000 additional revisions were adopted. The current regulations mandate that states list impaired and threatened waters, develop TMDLs, and make progress toward attaining state water quality standards. Additional funding has been secured to support state and EPA efforts, and OWOW is working to provide technical assistance to make it easier to develop TMDLs. Over the past year and a half, OWOW has issued a series of protocol documents for pathogens, nutrients, and sediments; posted maps of impaired waters and key policy documents on the TMDL web page; and sponsored numerous workshops and training sessions for key partners.